

IN THE CLAIMS

Please amend the claims to read as follows:

Listing of Claims

1-8. (Canceled).

9. (Previously Presented) A communication terminal apparatus that performs radio communication with a base station apparatus that transmits from a first antenna and a second antenna common pilot channel signals that are separable, the common pilot channel signal transmitted from the first antenna being accompanied by a dedicated channel signal having a same phase as said common pilot channel signal, the common pilot channel signal transmitted from the second antenna being accompanied by a dedicated channel having a phase rotated from said common pilot channel signal by a candidate phase rotation amount selected from a plurality of candidate phase rotation amounts, the communication terminal apparatus comprising:

a first channel estimator that performs channel estimation with respect to the common pilot channel signal from the first antenna and outputs a first estimation value;

a second channel estimator that performs channel estimation with respect to the common pilot channel signal from the second antenna and outputs a second estimation value;

a third channel estimator that performs channel estimation with respect to the dedicated channel signals from the first and second antennas and outputs a third estimation value;

a phase rotation amount estimator that estimates the phase rotation amount selected in the base station apparatus;

a channel estimation value synthesizer that synthesizes the first estimation value, a value obtained from the second estimation value by applying the phase rotation amount estimated in the phase rotation amount estimator to said second estimation value, and the third estimation value so as to calculate a definite channel estimation value; and

a demodulator that demodulates the dedicated channel signals using the channel estimation value calculated in the channel estimation value synthesizer.

10. (Currently Amended) The communication terminal apparatus or of claim 9, wherein:

on a per candidate phase rotation amount basis, the phase rotation amount estimator calculates a synthesis value of the first estimation value and a value obtained from the second

estimation value by applying a candidate phase rotation amount to said second estimation value, multiplies a real part and an imaginary part of the synthesis value and a real part and an imaginary part of the third estimation value, respectively, and adds the multiplication result of the real parts and the multiplication result of the imaginary parts so as to calculate an amplitude; and

the phase rotation amount estimator estimates at least one of the plurality of candidate phase rotation amounts, with respect to which a smallest amplitude is calculated, to be the phase rotation amount selected in the base station apparatus.

11. (Previously Presented) A communication terminal apparatus that performs radio communication with a base station apparatus that transmits from a first antenna and a second antenna common pilot channel signals that are separable, the common pilot channel signal transmitted from the first antenna being accompanied by a dedicated channel signal having a same phase as said common pilot channel signal, the common pilot channel signal transmitted from the second antenna being accompanied by a dedicated channel having an amplitude multiplied by a amplitude coefficient selected from a plurality of candidate amplitude coefficients and having a phase rotated from said

common pilot channel signal by a phase rotation amount selected from a plurality of candidate phase rotation amounts, the communication terminal apparatus comprising:

a first channel estimator that performs channel estimation with respect to the common pilot channel signal from the first antenna and outputs a first estimation value;

a second channel estimator that performs channel estimation with respect to the common pilot channel signal from the second antenna and outputs a second estimation value;

a third channel estimator that performs channel estimation with respect to the dedicated channel signals from the first and second antennas and outputs a third estimation value;

an amplitude and phase rotation amount estimator that estimates the amplitude coefficient and the phase rotation amount selected in the base station apparatus;

a channel estimation value synthesizer that synthesizes the first estimation value, a value obtained from the second estimation value by applying the amplitude coefficient and the phase rotation amount estimated in the amplitude and phase rotation amount estimator to said second estimation value, and the third estimation value so as to calculate a definite channel estimation value; and

a demodulator that demodulates the dedicated channel signals using the channel estimation value calculated in the channel estimation value synthesizer.

12. (Previously Presented) The communication terminal apparatus of claim 9, wherein:

on a per candidate phase rotation amount basis, the phase rotation amount estimator calculates a synthesis value of the first estimation value and a value obtained from the second estimation value by applying a candidate amplitude coefficient and a candidate phase rotation amount to said second estimation value, multiplies a real part and an imaginary part of the synthesis value and a real part and an imaginary part of the third estimation value, respectively, and adds the multiplication result of the real parts and the multiplication result of the imaginary parts so as to calculate an amplitude; and

the phase rotation amount estimator estimates at least one of the plurality of candidate amplitude coefficients and at least one of the plurality of candidate phase rotation amounts, with respect to which a smallest amplitude is calculated, to be the amplitude coefficient and the phase rotation amount selected in the base station apparatus.

13. (Previously Presented) The communication terminal apparatus or claim 9, further comprising a multiple channel estimation value synthesizer that corrects a plurality of channel estimation values calculated in the channel estimation value synthesizer, such that the phase rotation amount synchronizes between said plurality of channel estimation values, and synthesizes the corrected channel estimation values.

14. (Previously Presented) A channel estimation method in a communication terminal apparatus that performs radio communication with a base station apparatus that transmits from a first antenna and a second antenna common pilot channel signals that are separable, the common pilot channel signal transmitted from the first antenna being accompanied by a dedicated channel signal having a same phase as said common pilot channel signal, the common pilot channel signal transmitted from the second antenna being accompanied by a dedicated channel having a phase rotated from said common pilot channel signal by a candidate phase rotation amount selected from a plurality of candidate phase rotation amounts, the communication terminal apparatus comprising:

a first channel estimation step of performing channel estimation with respect to the common pilot channel signal from the first antenna and outputting a first estimation value;

a second channel estimation step of performing channel estimation with respect to the common pilot channel signal from the second antenna and outputting a second estimation value;

a third channel estimation step of performing channel estimation with respect to the dedicated channel signals from the first and second antennas and outputting a third estimation value;

a phase rotation amount estimation step of estimating the phase rotation amount selected in the base station apparatus; and

a channel estimation value synthesis step of synthesizing the first estimation value, a value obtained from the second estimation value by applying the phase rotation amount estimated in the phase rotation amount estimation step to said second estimation value, and the third estimation value so as to calculate a definite channel estimation value.

15. (Previously Presented) A channel estimation method in a communication terminal apparatus that performs radio communication with a base station apparatus that transmits from a first antenna and a second antenna common pilot channel signals

that are separable, the common pilot channel signal transmitted from the first antenna being accompanied by a dedicated channel signal having a same phase as said common pilot channel signal, the common pilot channel signal transmitted from the second antenna being accompanied by a dedicated channel having an amplitude multiplied by an amplitude coefficient selected from a plurality of candidate amplitude coefficients and having a phase rotated from said common pilot channel signal by a phase rotation amount selected from a plurality of candidate phase rotation amounts, the communication terminal apparatus comprising:

- a first channel estimation step of performing channel estimation with respect to the common pilot channel signal from the first antenna and outputting a first estimation value;

- a second channel estimation step of performing channel estimation with respect to the common pilot channel signal from the second antenna and outputting a second estimation value;

- a third channel estimation step of performing channel estimation with respect to the dedicated channel signals from the first and second antennas and outputting a third estimation value;

- an amplitude and phase rotation amount estimation step of estimating the amplitude coefficient and the phase rotation amount selected in the base station apparatus; and



a channel estimation value synthesis step of synthesizing the first estimation value, a value obtained from the second estimation value by applying the amplitude coefficient and the phase rotation amount estimated in the amplitude and phase rotation amount estimator to said second estimation value, and the third estimation value so as to calculate a definite channel estimation value.

16. (Previously Presented) The channel estimation method of claim 14, further comprising a multiple channel estimation value synthesis step of correcting a plurality of channel estimation values calculated in the channel estimation value synthesis step, such that the phase rotation amount synchronizes between said plurality of channel estimation values, and synthesizing the corrected channel estimation values.